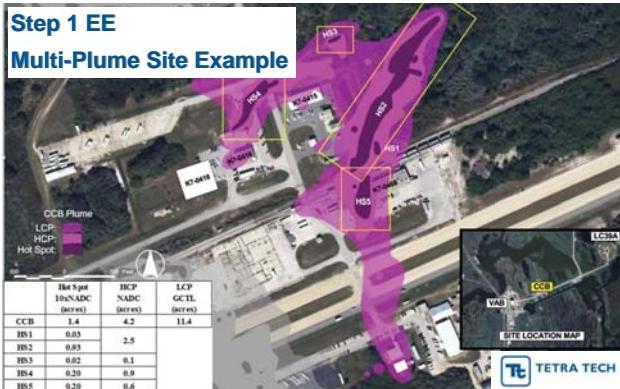
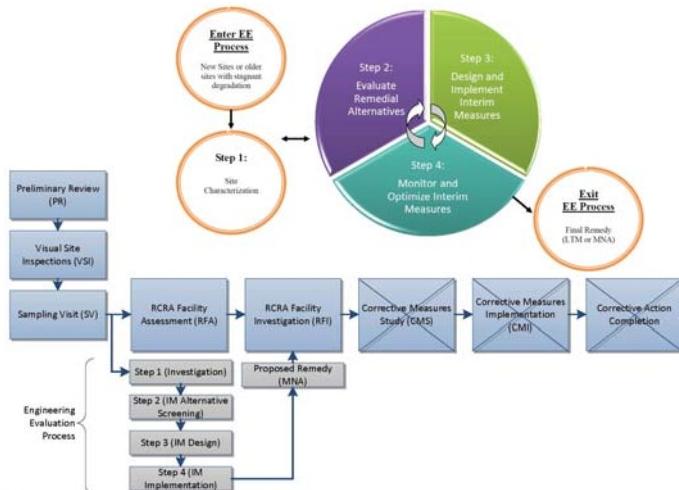




KSC Engineering Evaluation (EE) Process

- Preliminary Assessment/Possible Release Locations
 - Step 1 EE – Characterization
 - Step 2 EE – Remedial Alternative Screening
 - Step 3 EE – Remedial Design
 - Step 4 EE – Remedial Implementation
- Multi-step process developed to:
 - Ensure adequate site characterization
 - Integrate stakeholder participation in evaluation of remedial technologies
 - Review preliminary designs
 - Evaluate the efficacy of interim measures (IMs)
- CMS Work Plan Process integrated into EE Process
- Remedy conducted through IMs
- Each Step is presented to the KSC Remediation Team (KSCRT)
- In an Advanced Data Package (ADP)
 - KSCRT includes NASA contractors, NASA Remediation Project Managers, and FDEP
 - Package provided prior to presentation for team review
 - Team consensus reached for each Step of the process

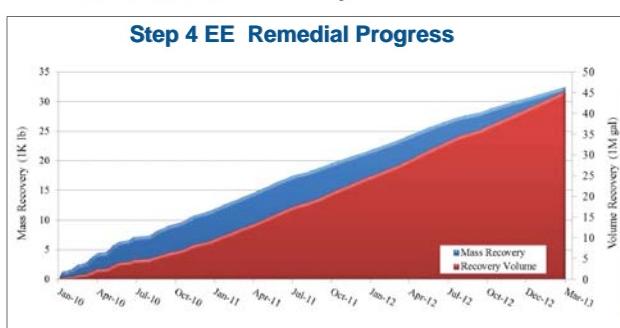


Step 2 EE—Remedial Alternative Evaluation

- Compile technologies into remedial alternatives ADP
 - Conceptual designs (layouts, design criteria, cost estimates)
 - Comparative analysis of alternatives
 - Supplemental attachment of all calculations
- Select remedy for Step 3 EE Remedial Design

Step 3 EE—Remedial Design

- Present final remedial design to KSCRT
- Present full design process calculations and drawings
- Present performance specification, monitoring, and exit strategy
- Provide detailed cost and duration modeling



Overview of Process

- Significantly streamline and enhance documentation and design process
 - Multi-disciplinary team of stakeholders vested in a common goal of project success
 - Investigation to remedy timeframe reduced
 - Adaptive and progressive investigation and design methods
 - Cost savings from reduced reporting and enhanced designs applied to Performance of investigations and IMs
 - ADP presentation contains an overview of implementation and lessons learned
 - Allows for continued optimization

| Step 2 EE Remedial Alternatives Summary Example | | |
|---|--|---|
| No. | Alternative | General Components |
| G-1 | Air Sparging | AS wells (6 shallow, 18 shallow-intermediate, and 40 intermediate), AS system (rotary claw compressed air pump, heat exchanger, and instrumentation), and conveyance trenching and piping. |
| G-2 | Anaerobic Bioremediation with Recirculation | Injection and extraction wells for application of substrate through recirculation (30 injection wells and 8 extraction wells). Extraction pumps, substrate mixing, and conveyance piping/tubing. |
| G-3 | Anaerobic Bioremediation with Recirculation and EZVI Injection in HS1 SZ | Injection and extraction wells for application of ethyl lactate through recirculation (30 injection wells and 8 extraction wells). Extraction pumps, substrate mixing, and conveyance piping/tubing. Injection of EZVI at 2 locations at HS1. |
| G-4 | Anaerobic Bioremediation with Recirculation and Selective Treatment | Injection and extraction wells for application of ethyl lactate through recirculation (30 injection wells and 8 extraction wells). Extraction pumps, infiltration gallery, air stripper, substrate mixing, and conveyance piping/tubing. |
| G-5 | Anaerobic Bioremediation with Recirculation, Selective Treatment, and EZVI Injection in HS1 SZ | Injection and extraction wells for application of ethyl lactate through recirculation (30 injection wells and 8 extraction wells). Extraction pumps, infiltration gallery, air stripper, substrate mixing, and conveyance piping/tubing. Injection of EZVI at 2 locations at HS1. |

Step 4—Remedial Implementation

- Summarize performance of selected remedy
- Present an ADP with an overview of implementation and lessons learned
- Continue optimization
 - Prepare additional presentations for KSCRT for consensus as needed
 - Update and refine exit strategy

